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Langley Research Center
Hampton, Va. 23681-2199

Julia Cole/Chris Rink
(Phone: 757/864-6786)

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NASA HOPES TO PREDICT THE NEXT PERFECT STORM

NASA scientists hope a new international field experiment based along coastal regions of the North Atlantic Ocean will improve weather predictions for those affected by powerful winter storms.

Groups from NASA Langley Research Center, Hampton, Va., conducted aircraft-based experiments in November and December for the 2003 Atlantic Thorpex Regional Campaign (ATReC). Scientists will use the collected measurements to improve short-term forecasts for winter storms that have high social and economic impacts. The base of operations for the aircraft, NASA Dryden Flight Research Center's ER-2 and the University of North Dakota's Cessna Citation II, was Bangor, Maine.

"In the late fall, the storm systems along the U.S. east coast are very unique," said Bill Smith, Sr., a senior researcher at Langley. "The tropical storms are still in the Atlantic but cold air is also coming down from Canada."

As told in the book, "The Perfect Storm," by Sebastian Junger and dramatized in the movie by the same name, two air masses (or fronts) and a hurricane collided over the Atlantic Ocean to form what the National Weather Service called the perfect storm.

The perfect storm that took the lives of the men at sea on the *Andrea Gail* in October 1991 was an extraordinary example of the severe winter weather that threatens the U.S. eastern seaboard.

More common though are Nor'easters, massive storms created when cold air from Canada collides with warm air over the Atlantic. They can cause severe flooding and beach erosion, dump snow and ice over the United States, cause hazardous conditions for commercial ships and impact the weather in Europe.

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Scientists from Thorpex, a global atmospheric research program, and the European Composite Observing System program, also participated in the ATReC field campaign. Researchers are tracking winter storms across the North Atlantic using instruments on aircraft, commercial ships sailing across the Atlantic, ground stations and satellites. Scientists believe that taking extra observations of winter storms and other storm-prone areas of the atmosphere can provide the data necessary to reduce errors in forecasting winter weather.

While Langley activities will support the goals of ATReC, scientists will also use the field observations for other projects and NASA's Aviation Safety Program.

Measurements taken by the Advanced Satellite Aviation Weather Products (ASAP) applications team, managed by NASA Langley, will also help improve aviation weather forecasts. Predictions of weather harmful to aircraft safety are developed by the Federal Aviation Administration's Aviation Weather Research Program and supported by NASA's Aviation Safety and Security Program.

The Tropospheric Airborne Meteorological Data and Reporting instrument on the Citation aircraft will also collect measurements of conditions such as temperature, icing and wind speed to test its accuracy during the field experiment. NASA developed the instrument under the Weather Accident Prevention project to increase the weather information available to a pilot in a general aviation or commercial cockpit.

ATReC is the second in a series of ocean observation campaigns to support THORPEX, a 10-year international research program working with the World Meteorological Organization World Weather Research Program. ATReC also is the largest of three field experiments planned as part of the European Composite Observing System Studies Program.

Some of the funding for these studies was provided by NASA's Earth Science Enterprise, which is dedicated to understanding the Earth as an integrated system and applying Earth System Science to improve prediction of climate, weather and natural hazards.

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